

BINARY CODED DECIMAL ADDITION

ABSTRACT

The binary coded decimal (BCD) adder circuit adds two BCD encoded operands, with an
5 input carry bit, and produces a BCD encoded sum. The adder has three stages. The first
stage receives two BCD encoded operands as inputs, groups the inputs into contiguous
blocks of 4-bits each, computes an intermediate sum vector and carry vector without
considering the input carry bit, and also computes propagation and generate functions for
each 4-bit group. The second stage is a carry look ahead circuit which computes all
10 carries from the input carry, and the propagate and generate functions of the 4-bit groups
from the first stage. The third stage adjusts the intermediate sum vector with pre-
correction factors which depend upon the input carry and the carries generated from the
second stage and the carry vectors from the first stage.